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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/827,904	04/06/2001	Ami Ei Agizy	9999	5548

25688 7590 05/29/2003

TICONA LLC  
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SUMMIT, NJ 07901

EXAMINER
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ALEJANDRO, RAYMOND

ART UNIT	PAPER NUMBER
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1745

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DATE MAILED: 05/29/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/827,904

Applicant(s)

AGIZY ET AL.

Examiner

Raymond Alejandro

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 16 May 2003.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-4 and 6-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 6-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 April 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Response to Amendment***

This communication is responsive to the amendment filed 05/16/03. The applicants have overcome the objections and the 35 USC 112 rejections, and the 35 USC 103 rejection.

However, the instant claims are finally rejected over art as seen below for the reasons of record.

### ***Claim Rejections - 35 USC § 103***

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
2. Claims 1-4 and 6-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wilson et al 6248467 in view of Guthrie 6048635 and further in view of Carlstrom Jr 6200698.

The instant application is directed to a fuel cell end plate wherein the disclosed inventive concept comprises the specific materials. Other limitations include the specific diameter, content, length and polymers, the calculated resistance, and the end plate function.

With respect to claims 1, 4, 14 (see rejection below):

Wilson et al disclose a bipolar separator plate for fuel cell consisting of a molded mixture of a vinyl ester resin and graphite powder; also, the addition of certain fiber reinforcements and other additives can improve the properties of the composite material (abstract). It is disclosed that the use of thermosetting resins for plate productions offers advantages (col 1, lines 60-68). It is further disclosed that the bipolar plate is formed from a thermosetting resin which may further include short fiber of reinforcements as glass (col 2, lines 30-40). It is further disclosed that conventional composites are typically fiber reinforced to provide additional strength and/or

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flexibility, and such reinforcements include fiber of glass (col 4, lines 61-68). It is disclosed that sized fibers improves adhesion or chemical bonding; and any fiber reinforcement need to be relatively short to attain good fill, void hand lay-up, an provide a relatively homogenous structure, as a result, short microfibers ( $< 1$  mm) are used (about 5mm as instantly recited) (col 4, line 61 to col 5, line 15).

*It is also noted that a biplate is a two-sided component which is placed between the membrane electrode assembly in a fuel cell stack wherein its faces are oriented to the anode and cathode surface, providing electrical contact to both of the membrane electrode assembly and separating oxidant from fuel; further, the endplate is a fuel cell component which forms part of the last fuel cell compartment in a stack; if the cells are not stacked, the endplate is simply a wall of the fuel cell, the end plate provides electrical contact between an electrode and the electrical load. Thus, the endplate is simply a single-ended biplate and hence, both fuel cell components (the biplate and end plate), are electrically conductive elements. Therefore, both components can be interchangeably used within a fuel cell structure. Thus, the characteristics and properties of Wilson et al's bipolar plate also apply to the end plate.*

As to claims 2 and 6 (see rejection below):

It is disclosed that glass fiber has a diameter of  $16\text{ }\mu\text{m}$  (Table 1).

As to claim 10-11:

As to the method limitation, i.e. injection molding, it is noted that a method limitation incorporated into a product claim does not patentable distinguish the product because what is given patentably consideration is the product itself and not the manner in which the product was made. Therefore, the patentability of a product is independent of how it was made.

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As for claim 15-16, 17-18 (see rejection below):

It is disclosed that the end plates contact end ones of bipolar plates, and are tightened to compress the stack of bipolar plates and membrane electrode assemblies between end plates (col 3, lines 15-35). Figure 2 also shows the end plate embodiment wherein the end plate serves as a compression plate and does not necessitate a distinct and separate compression plate.

Wilson et al disclose bipolar plates according to the foregoing. However, Wilson et al do not disclose the specific glass fiber weight percent and the specific glass fiber length.

With respect to claims 1, 3, 8 (see rejection below):

Guthrie disclose end plate assemblies in a fuel cell stack (abstract) wherein the endplate header is fabricated from a polymeric material which preferably has a filler added to the extent of at least 30 % (about 30 % weight, or about 40 % weight or about 50 weight % as instantly claimed) ; a glass fiber is preferred (col 3, line 60 to col 4, line 9). The recitation "to the extent of at least 30 %" is interpreted as a polymeric material containing more than 30 % of glass fiber.

As to claims 12-13:

It is noted that the prior art of record inherently discloses the specific calculated resistance as the material and composition employed therein are substantially the same as the material and composition of the instant claims. It is also noted that the specific calculated resistance is a customized ratio of strain % properties observed from that material.

In view of the above, it would have been obvious to one skilled in the art at the time the invention was made to make the plates of Wilson et al containing the specific weight percent of glass fiber as Guthrie teaches that this specific polymeric composite provides some of the same strength and thermal expansion characteristics of the electrically conductive metal material from

which the end plates are fabricated, but affords superior corrosion resistance and lighter weight.

*Moreover, since the term "about" have been employed to further limit the specific weight percent of glass fiber, the term "about" has been interpreted as a broader term including additional magnitudes beyond the specific range extreme values.*

With respect to the specific glass fiber length, it would be obvious a glass fiber having the specific length as Wilson et al disclose that sized glass fiber posses functional groups at the surface that can improve adhesion or provide chemical bonds to the resin. In general, these high-strength traditional fibers impart vastly improved mechanical properties in structural composites where long fibers or fabric rovings are used and the volume fractions of resin are typically quite high. In the case of electrically conductive composites for electrochemical applications, any fiber reinforcements that are used need to be relatively homogenous structure. As a result, short microfibers are utilized, thus, Wilson et al teaching's encompasses to use short length fibers. *Moreover, since the term "about" have been employed to further limit the specific weight percent of glass fiber, the term "about" has been interpreted as a broader term including additional magnitudes beyond the specific range extreme values.*

Wilson et al and Guthrie are applied, argued and incorporated herein for the reasons above. However, the foregoing references do not disclose the polymer being a polyphenylene sulfide.

With respect to claims (particularly) 5, 7, 9, and 14:

Carlstrom Jr discloses an end plate assembly for use in a fuel cell assembly in which the end plate assembly includes a housing formed from a plastic material such as polyphenylene

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sulfide (abstract/col 4, lines 18-25). It is also disclosed that the endplate assembly fixedly attach to an opposite endplate for compressing the fuel cell stack therebetween (col 2, lines 39-47).

In view of the above, it would have been obvious to one skilled in the art at the time the invention was made to use polyphenylene sulfide to make the endplates of Wilson et al and Guthrie as Carlstrom Jr teaches that it would be appreciated that such suitable material allows the endplate assembly to be lightweight.

As to claims 6, 8, 16-18:

Refer to rejection above which contains the specific subject matter of said claims.

### ***Response to Arguments***

3. Applicant's arguments with respect to claims 1-4 and 6-18 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

4. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

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CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Raymond Alejandro whose telephone number is (703) 306-3326. The examiner can normally be reached on Monday-Thursday (8:30 am - 7:00 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's primary examiner, Steve Kalafut can be reached on (703) 308-0433. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Raymond Alejandro  
Examiner  
Art Unit 1745

  
STEPHEN KALAFUT  
PRIMARY EXAMINER  
GROUP 1700